·Case Report·

Orbital apex syndrome after tooth extraction in an immunocompromised patient

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Abstract

• A 60 year-old man presented with acute on set of left eye proptosis and ptosis. It was associated with poor vision, eye pain and restriction of eye movement of the same eye after 5 hours post left upper molar tooth extraction. The visual acuity in the left eye was hand movement. There was severe ptosis and proptosis of the left eye. The conjunctiva was chemotic with quite anterior chamber. The pupil was mid dilated and sluggished to light. The ocular movement was restricted in all directions. Fundoscopy of the left eye revealed features of central retinal artery occlusion with hyperaemic disc and subretinal exudates at posterior pole. The right eye appeared normal. Urgent MRI brain and orbit revealed severe left paranasal sinusitis with anterior displacement of the left globe and presence orbital abscess. Patient was managed with Otorhinolaryngology and Neurosurgery teams. He underwent emergency transnasal drainage of abscess. Histopathological examination of unhealthy sinus mucosa showed evidence of fungal infection. However, the culture and sensitivity result was inconclusive. Patient was treated with amphotericin B, ceftriaxone, amoxicillin clavulanate and metronidazole. Patient was detected to have high blood sugar level and was managed accordingly. The proptosis improved with treatment. However, his vision, ptosis and ophthalmoplegia remained static. Assessing the immunocompromised status is important for the management of patient presented as acute orbital apex syndrome to avoid fatal outcome.

• KEYWORDS: orbital apex syndrome; tooth extraction; proptosis; ptosis; ophthalmoplegia

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INTRODUCTION

Infection in the tooth socket and extending to orbital cavity through paranasal sinuses is rare but it can result significant morbidity and mortality. Optic neuropathy, visual loss and multiple cranial nerve palsy with eye structures motility impairment are the hallmark of orbital apex syndrome (OAS)[1-5]. Aetiology may be due to variety of problems such as inflammations, infections, iatrogenic/traumatic and vascular origins[6]. Tooth extraction in immunocompromised patient like undiagnosed diabetes mellitus (DM) can lead to acute visual impairment as a result of OAS[7].

CASE REPORT

A 60 year-old man presented left upper gum swelling associated with left side facial pain for one-week duration. He was diagnosed to have generalised chronic periodontitis by dentist and underwent left 1st upper molar tooth extraction after completion of one-week course antibiotic. After tooth extraction, he developed sudden onset left upper lid ptosis associated proptosis, which progressively increased in 5 hours duration. It was associated with left eye pain together with facial pain and deterioration of his left vision. Patient was not known to have diabetes mellitus or other medical illness. General examination revealed an ill looking patient with moderately dehydrated and stable vital signs. There was complete ptosis of the left eye as well as axial proptosis with lid and conjunctival oedema (Figure 1A and B). His left eye visual acuity was hand movement with total ophthalmoplegia (Figure 2). The pupil was sluggished and mid-dilated with positive relative afferent pupillary defect. Left fundus showed hyperaemic disc with generalised pale retina suggestive of central retinal artery occlusion and presence of subretinal exudates at the posterior pole. The intraocular pressure was 36mmHg.

Figure 1 Clinical features at presentation A: Left eye complete ptosis and proptosed; B: Proptosis and chemotic conjunctiva

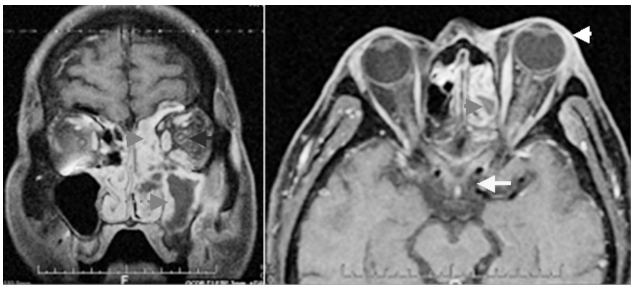

Figure 2 MRI prominent left ethmoidal sinus (solid red arrow) and maxillary sinus (dotted red arrow), left optic perineuritis (blue arrow) with left proptosis (white arrow) and normal cavernous sinus (yellow arrow)

Urgent MRI of brain and orbit revealed extensive left side ethmoidal, frontal and maxillary sinusitis with features of orbital cellulitis with suspicious presence of orbital abscess and causing anterior displacement of the left globe (Figure 2). There was also presence of 'doughnut sign' in the left optic nerve suggestive of optic perineuritis. An emergency drainage of the paranasal sinuses and decompression of the orbit was performed by an Otorhinolaryngiologist and Neurosurgeon and a copious amount of purulent discharge was drained out. Culture from the pus showed mixed growth of organisms and histopathological examination of unhealthy mucosal specimen showed chronic non specific inflammation suggestive of fungal infection. Nasal cavity swab showed presence of *Pseudomonas aeruginosa* which was sensitive towards amikacin, gentamicin, ciprofloxacin and ceftazidime. He was diagnosed to have left OAS due to left orbital abscess secondary to paranasal sinusitis following tooth extraction. At the same time his blood sugar level was very high at presentation and he was treated as newly diagnosed diabetes mellitus. The blood sugar was controlled medically prior to emergency drainage.

Patient was treated with systemic amphotericin B (20mg/d), ceftriaxone (2g/d), amoxicillin clavulanate (3.6g/d) and metronidazole (1.5g/d) according to the culture and sensitivity test. He was also treated with topical eye drops timoptol 0.5% twelve hourly and chloramphenicol 0.3% four hourly. There was reduction of proptosis at six weeks after treatment. However, his vision, ptosis and ophthalmoplegia remained. At eight weeks follow up there was no more proptosis, however his left eye remain ptotic and frozen with no vision. Unfortunately patient defaulted our follow up.

DISCUSSION

Extracting an infected tooth can gives a free access to the microorganisms to extend their vicinity to the nearby paranasal sinuses. Mostly infection to the ethmoidal sinus can lead to the incidence of OAS, even it is a rare situation but there were cases reported before [3]. Eighty percent of reported cases with orbital infections were developed as a complication of infection of the paranasal sinuses, with ethmoidal sinusitis being the most common source[2,8]. This is because the thin wall between orbit and ethmoidal air sinuses, where any infections can easily penetrate to orbital cavity. Most of the reported OAS cases occurred after few days following tooth extraction [1-3,9]. This is mainly due to time taken for the infection to spread from infected tooth socket to maxillary sinus, then other paranasal sinuses and finally to orbital cavity [4,9]. However, in our patient it occurred very fast within 5 hours. As we know orbit is a closed box area with lack of lymphatic and the valveless venous system[2] and an underlying diabetes mellitus that was undiagnosed before could be a possible reason for the shorter incubation period[7].

OAS has a very distinct feature where majority of patients will present with proptosis and ptosis. Further eye examination will reveal reduced vision, ophthalmoplegia and multiple cranial nerve palsies[1, 8]. Poorly controlled OAS may present with epidural and subdural empyema, meningitis, cerebritis, cavernous sinus thrombosis, brain abscess, and death can occur if the infection continues to spread along the optic canal, optic nerve, or the ophthalmic vein [2]. This patient presented with classical features of OAS with swollen left face especially cheek area. He also presented with optic perineuritis (OPN) which is not a common association of OAS. Optic perineuritis describes inflammation involving the optic nerve sheath evidenced by the characteristic pattern of enhancement around the optic nerve ("doughnut" on coronal views) in MRI scan. This patient became blind due to CRAO, which was caused by this OPN.

The panoramic radiograph to see the tooth socket and CT scan are the front line investigation for localising the abscess and to view the extension of infection but for the detailed soft tissues like orbital cavity and structures related to the eye, imaging study like MRI is a necessary. It makes us to

act fast in initiating treatment and prevent further damages to the eye and vision. Culture and sensitivity can help to confirm our diagnosis [3]. Our patient's diagnosis was made through histopathological examination of unhealthy left orbital tissue. Almost all OAS patients need admission for two reasons: first is to investigate the cause and second for close monitoring and management. Treatment is aimed to control the infection and most of the patients need variety of parenteral anti microbial treatment with surgical drainage of abscess[1,2,8]. Our patient was treated with multiple antibiotics including antifungal based on histopathological examination of paranasal mucosal tissue although culture showed inconclusive result. There was reduction of proptosis at six weeks after treatment however vision, ptosis and ophthalmoplegia remained static.

In conclusion, dental abscess or infection should be investigated for systemic immunocompromised condition prior to tooth extraction to avoid vision threatening complications or mortality. The dreadful complication of visual loss can be avoided if sinusitis is diagnosed and treated early and appropriately. Clinical experiences play a vital role in critical situation like this acute presentation of OAS.

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